Chapter 3

The Indiana Economy and Demographic Change

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Introduction

The close relationship between economic change and the demand for transportation makes the economy's future growth an important factor in future transportation demand. Investment in transportation can be very effective in promoting productivity, economic growth and improved living standards. Transportation infrastructure is also a fundamental and necessary part of the state's total capital stock. Transportation investments can generate time savings and a reduction in business operating expenses that yield productivity gains well in excess of the investment and environmental costs.

In order for Indiana to develop and invest in a transportation system that will serve the state's needs well into the next century, an understanding is needed of the changes occurring in the economy and how these changes will translate into future transportation demand. Specific questions concern:

- National trends affecting transportation demand;
- The structure of Indiana's economy, and;
- Demographic changes in Indiana's population.

Also needed is an understanding of how transportation supports the state's economy and how transportation investments can relate to greater productivity, economic growth and improved living standards.

National Trends Affecting Transportation Demand

Future demand for transportation services will be influenced by a variety of factors including changes in the production process, structural changes in the industrial sector (both institutional structure and types of products produced), shifts in the location of economic activity and the increased importance for the service sector of the economy. Three of these are discussed below:

Production Process Changes

Historically, production processes have been changing toward mass production. Increased economic uncertainty in recent years has created a need for differentiated production, such as production that allows for differences in products in response to changing preference. Many national and state firms have adopted new production techniques allowing for the rapid adoption and adaptation of final products to changes in demand, and production of various goods with the same production line.

In a recent report on the changing economy and its implication for future infrastructure use, the U.S. Department of Commerce observed that because of new computer-integrated flexible manufacturing systems, production will become much more of a local matter. Plants will be able to make differentiated products almost on demand. These new techniques require complex task programming, high labor skills, the ability to receive diverse input "just in time" and close relationships with markets.

It is anticipated that major national cities will become ringed by companies operating computer-integrated flexible manufacturing systems. This transformation will place greater emphasis on transportation distribution networks within metropolitan areas than on networks connecting different metropolitan regions.

Location of Economic Activities

As a result of the information revolution and advances in telecommunication and computer technology, many firms are now capable of separating parts of their production process. Management, research and development, and various phases of production can each be located optimally for function. Increasingly, this separation of functions is happening on a globally international level and can be expected to accelerate with the Congressional adoption of the North American Free Trade Agreement (NAFTA) and the General Agreement on Tariff and Trade (GATT). Separating the elements of economic activity is not limited to industry; it is just as pertinent for services.

Nationally, many businesses have relocated outside traditional urban locations. Businesses not requiring extensive face to face contacts have frequently shifted their operations to suburban or rural locations. A host of businesses of this type have formed as a result of advances in telecommunication and computer technology, and the availability of "instant" on-line information. This trend will very likely continue with continued advances in electronic information networks and telecommunications technology.

Rise of the Service Economy

Service sector growth is perhaps the most central factor in the transformation of the economy, leading some analysts to argue that the "new" economy is a service economy. This transformation can be viewed as a dramatic change in what is being produced and how it is being produced. Many products being produced are increasingly knowledge-related, and many are free standing services, such as health education. In addition, the technology and location of production has changed with the advent of flexible systems and functional differentiation. Both changes result in, and are reflected in, the emergence of the service sector.

From a national perspective, several service activities such as retailing and distributive services (e.g., transportation, communication, wholesaling, utilities) did not grow faster than the rest of the economy during the last twenty years. In certain areas, however, where tourism or retirees have become a major component of the local economic base, such services have grown dramatically. The location and labor needs of such services are very different from those of producer or non-profit (education, health and government) services. Specifically, these services require a large unskilled or semi-skilled labor force at the location where these services are provided. These differences among services are likely to have implications for transportation demand.

In addition to the shift from a manufacturing to a service based economy, other structural economic changes are occurring that will impact the demand on Indiana's transportation system. One of the most important of these changes is the globalization of the national and state economy. The end of the cold war, advances in information systems technology, telecommunications networks and transportation have led to the growth of an economy in which nations of the world are increasingly interdependent. This trend toward globalization is expected to continue and even accelerate with the realization of further technological advances, the elimination of international trade barriers, monetary system interdependence, and as more advanced communications and transportation technologies are introduced.

International Trade

International trade will be an increasingly important source of economic expansion, both in the domestic economy and in the State of Indiana. Today, the other advanced nations of the world are Indiana's major trading partners. Tomorrow, the newly industrialized nations and "third world" countries may become important markets for Indiana's consumer goods, although Indiana will

be faced with stiff competition for market share, especially from firms located in the Pacific rim and the European Economic Community.

Structure of the Indiana Economy

The Indiana economy is both diversified and changing. Employment and gross state product information help to measure that diversity and to determine how the economy is changing. These data items also provide a means for observing trends that will certainly influence Indiana's economic future. A discussion of each item follows.

State Employment

A total of 3,062,851 Hoosiers were employed in 1990, an increase of almost 800,000 or 35 percent over the 1970 employment figure. **Table 1** illustrates how Indiana employment patterns have changed since 1970 among selected types of employment. This table, based on U.S. Bureau of Economic Analysis (BEA) data, reveals that while farming and manufacturing declined as a percentage of total Indiana employment, retailing, F.I.R.E. (finance, insurance and real estate) and services increased. In many cases employment decreases in farming and manufacturing appear both proportionately and in real numbers. The largest changes over the twenty (20) year period occurred in manufacturing, down to 21.2 percent, and services, up to 22.9 percent of Indiana's total 1990 employment. Between 1970 and 1990 the largest share of employment growth occurred in the service sector, where 370,000 new jobs were created, an increase of over 111 percent. In summary, services supplanted manufacturing as the largest employer type in Indiana, and employment is now more distributed over a wide array of employment types.

Table 1

Indiana Employment Sector Changes, 1970-1990

Sector	1970	1975	1980	1985	1990
Farming	119,977	127,134	118,700	107,731	86,923
% Total	5.30	5.35	4.56	4.01	2.84
Manufacturing	717,162	653,740	665,422	619,949	649,684
% Total	31.69	27.53	25.56	23.06	21.21
Retail	355,537	381,657	438,530	460,687	546,429
% Total	15.71	16.07	16.85	17.14	17.84
F.I.R.E.	104,408	126,055	152,812	164,429	189,457
% Total	4.61	5.31	5.87	6.12	6.19
Services	322,444	404,089	473,733	574,130	703,350
% Total	14.69	17.02	18.20	21.36	22.96
TOTAL	2,262,881	2,374,674	2,602,952	2,687,845	3,062,851

Indiana's employment growth during the two decades between 1970 and 1990 lagged behind the nation as a whole. As stated earlier, Indiana's employment during that period grew approximately 35 percent. The total United States growth for the same period was over 52 percent. However, the pattern of Indiana's growth was similar to that of the nation. For both Indiana and the United States as a whole, the categories that showed the greatest increases between 1970 and 1990 were trade (wholesale and retail) and services.

The Role and Implications of Transportation In Indiana's Economy

Transportation links Indiana's economic future with the world. Indiana's aviation, highway, rail, port, and transit systems have proven to be a competitive asset in the midwest and the nation. Continued development of this transportation network for domestic and evolving world markets will permit Indiana to maximize its geographic location as comparative and competitive advantages. Indiana cannot afford to allow its transportation systems to become a liability for businesses trying to remain competitive in a global economy. The relationship between Indiana's transportation systems and the state's economy will become increasingly apparent with the adoption of the NAFTA and GATT agreements.

The restructuring taking place in Indiana's economy will also have implications for transportation demand in the future. Indiana's transportation systems will have to serve the expanding service sector and a changing manufacturing sector. The implications of economic restructuring will be evident in the intermodal transportation of people, goods and freight.

Changes to flexible production techniques will require more frequent goods and freight movement. For the flexible production system to operate, a variety of inputs (custom parts, specialized labor, unique tools and equipment) must be available at production facilities precisely when needed. Finished products must then be transported rapidly and efficiently to distribution and consumption points throughout the world. Failure to deliver inputs on time may disrupt the production process and result in significant losses for the producers. The implication for Indiana's transportation modes is the growing importance of system reliability --producers must be assured of receiving needed inputs at the right place and time, and at the lowest possible minimum cost.

Production and consumer shifts toward low-volume, high-value goods could mean that Indiana's transportation services will need to provide quick transport for small quantities of high-value goods. This shift will have significant impacts on modal choice. Specifically, the need for multimodal and intermodal

transportation services will put additional strain on Indiana's aviation, highway, rail, port, and transit systems. The continued importance of manufacturing production activities in the state's economy will require Indiana to have a flexible and reliable highway system with relatively seamless intermodal connections.

The scattering of production processes, made possible by advances in information systems, telecommunications and an increased reliance on sub-contractors for inputs, will affect the interrelationship of Indiana's transportation systems. Future goods and freight movements will change dynamically in response to a global market. Shipping patterns will become increasingly complex with the reduction of trade barriers and the advent of global economic integration. Therefore, the flexibility of Indiana's transportation systems to accommodate rapidly changing domestic and international traffic patterns will become more important. Due to the flexibility that they allow producers and shippers, an intermodal mix of aviation, highways, ports and railroads are likely to be used the most for transportation in the new economy.

Economic restructuring will likely affect the demand for transportation of people. Most routine jobs in the private sector will need good access to pools of competitive wage labor. At the same time, businesses will demand adequate transportation facilities within large geographic areas in order to reach customers with many different services, such as health care, insurance, banking and financial services and a variety of personal services.

Consistent with the broad focus of this transportation plan, no attempt was made to address in this document the changes in transport likely to occur in urban and suburban areas. Subsequent plans developed in cooperation with the urbanized area Metropolitan Planning Organizations (MPOs) will address Indiana's future urban and suburban transportation needs. As the service sector increases in importance, the ability to serve urban transportation needs will become more and more critical for sustaining economic growth in the state.

Indiana's multimodal transportation systems and their intermodal connections will play a unique role in the state's efforts to sustain economic growth, to create the right environment for new business starts, to aid in the retention or expansion of existing business, and to enhance the attraction of new businesses. Indiana's transportation system must support such a business environment. The presence or absence of adequate transportation services is a critical factor in most business location decisions. Not only are raw materials and finished goods conveyed to plants or markets, but employees, customers, service personnel, tourists and vacationers rely on transportation to arrive at their destinations. Businesses that are easy to reach are typically more successful than

those with lower visibility and less convenient access. Transporting goods and freight to a business with poor access costs more than transporting to one with good access. Dynamically efficient and effective transportation system services can lower costs for businesses and industry and lead to increased clientele or expanded market areas. Realization of these goals can translate into a stronger state economy with a higher potential for sustained long-term economic growth.

Recognition of transportation's key role in Indiana's economic environment led INDOT to focus on a series of objectives for its multimodal transportation systems. As noted below, Indiana's transportation systems will support Indiana's economic growth by:

1. Linking Indiana's major population concentrations to the national and international transportation networks;
2. Providing good accessibility to Indiana's major production and manufacturing concentrations;
3. Providing good accessibility to Indiana's major trade and service concentrations;
4. Improving access to Indiana's major tourism and recreation areas, regional economic concentrations and to those areas with demonstrated and anticipated potential for growth;
5. Adequately linking the state's major modal facilities and intermodal connections to improve the aggregate transportation system; and
6. Providing access to and from major population concentrations outside Indiana, major domestic and global markets, and greater integration of Indiana with the global economy.

Additional discussions on the development of Indiana's multimodal transportation systems, intermodal linkages and their importance to the state's economy are noted in Chapters 6 through 11 of this document.